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March 11, 2010

County of San Diego
Department of Planning and Land Use
5201 Ruffin Road, Suite B
San Diego, CA 92123

North County Fire Protection District
315 East Ivy Street
Fallbrook, CA 92123-1666

SUBJECT: REVISED FIRE PROTECTION PLAN – LETTER REPORT
Emerald Hills Minor Subdivision, TPM 21057
APN 126-250-23

This Fire Protection Plan (FPP) – Letter Report is being submitted as an evaluation, pursuant to Article 86 of the California Fire Code, of the adverse environmental effects that a proposed project may have from wildland fire and mitigation of those impacts to ensure that the above referenced project does not unnecessarily expose people or structures to a significant risk of loss, injury or death involving wildland fires.

PROJECT DESCRIPTION

The proposed project is a Tentative Parcel Map to split Assessor Parcel Number 126-250-23 into four parcels and a remainder parcel. The four parcels range in size from 2.47 gross acres to 3.24 gross acres. The remainder parcel is 8.13 gross acres. The site contains an existing single-family residence that will be removed.

ENVIRONMENTAL SETTING

1) **Location:** The project is located within an area of rural residential development and agricultural operations. The site is bordered to the north, south and west by estate style residences and groves. The site is bordered to the east by Highway 76 and the San Luis Rey River.

2) **Topography:** The site is located in an area of rolling hills and areas of steep slopes. The average slopes per parcel range from 17.6% to 24.4%. The east side of the property contains steeper slopes with a primary aspect of ninety degrees from the north. The west side of the property contains gentler slopes with a primary aspect of 270 degrees from the north.

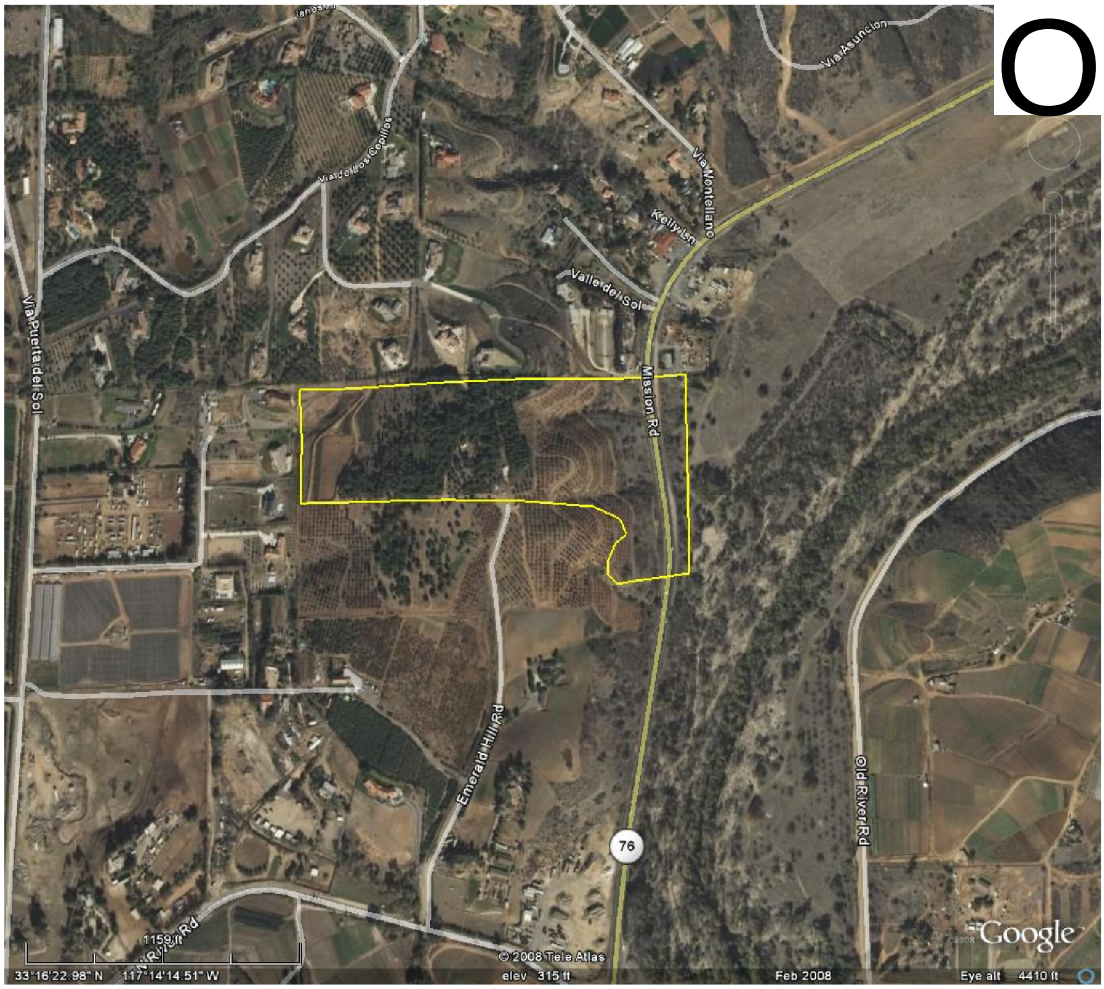
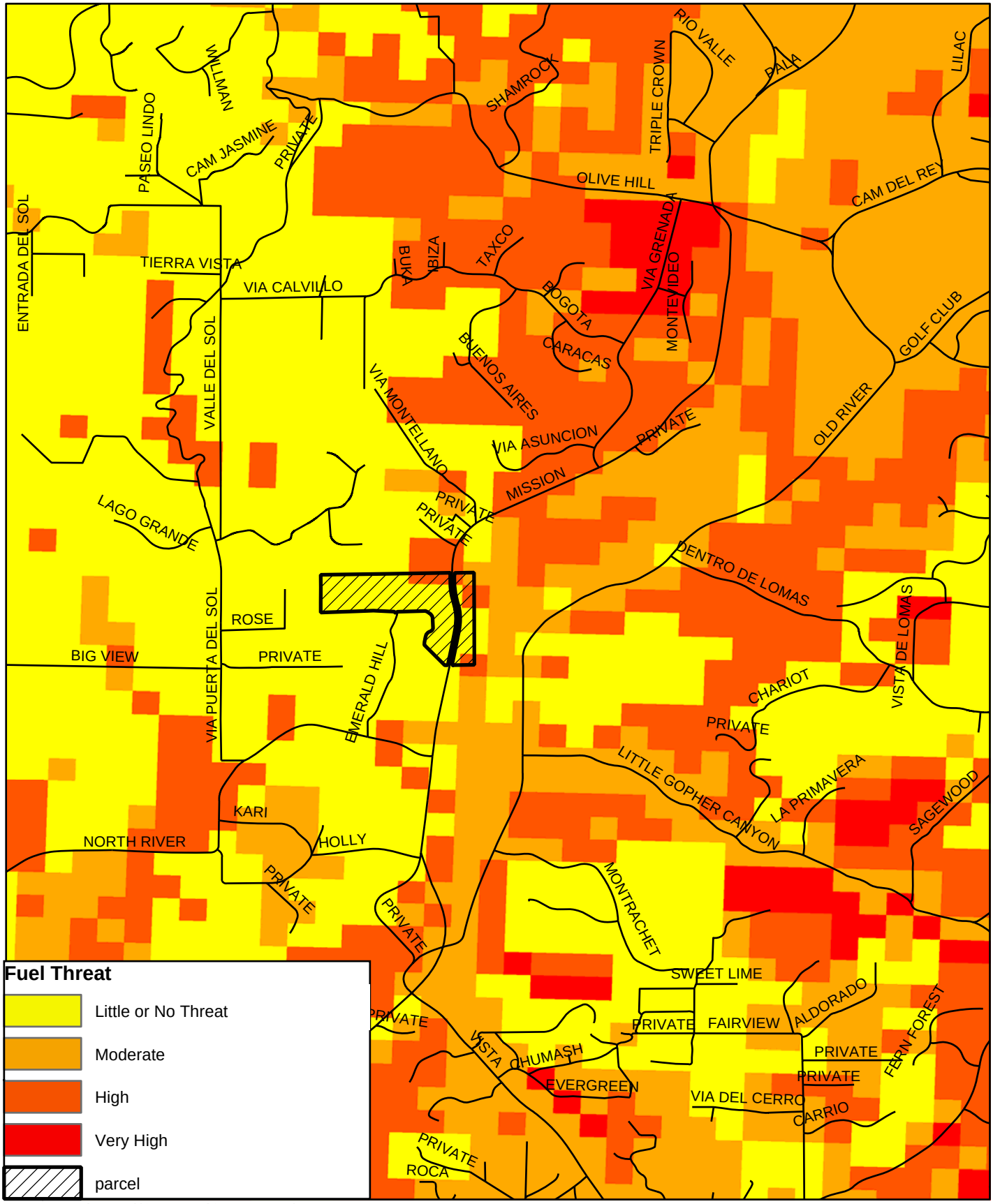


Figure 1
Land Use
Emerald Hills Property



Source: http://frap.cdf.ca.gov/

Figure 2
Fire Threat Map
Emerald Hills Property

3) **Flammable Vegetation:** The majority of the site is used for agricultural pursuits such as avocado groves and persimmon trees. Additionally, non-native grassland, and Diegan coastal sage occur on-site. Native vegetation is a minimum of approximately 200 feet from any of the proposed pads (Figure 1). The project is mapped as occurring primarily within an area of low and moderate fuel threat by CalFire (Figure 2).

4) **Climate:** The project site is located within the coastal climate zone. It is located in an area that receives an average of 14 inches of rainfall annually. (Climates of San Diego County, Agricultural Relationships, University of California, Agricultural Extension Service, and U.S. Weather Bureau.)

PROJECT EXPOSURE TO WILDLAND FIRES

1. **Water Supply**

The project is located within the Rainbow Municipal Water District.

Fire Hydrants:

Two residential type fire hydrants shall be installed to North County Fire Protection District and Rainbow Municipal Water District standards prior to the radius of both cul-de-sacs. Hydrants shall have drip caps and blue-dot markers, capable of supplying 1500 gallons per minute with 2500 gallons per minute in the main.

2. **Fire Access Roads**

Location:

Access will be provided by an extension of Emerald Hill Road. Individual driveways shall serve the proposed parcels. A proposed "fire and emergency evacuation only" road is discussed under Secondary Access.

Width:

Emerald Hill Road on and offsite shall be improved to 24 feet in width with an asphaltic concrete surface and terminate in cul-de-sacs with 36 foot asphaltic concrete radius surface. The private driveways serving the proposed parcels shall be improved to an 18 foot graded width with 16 foot finished in asphaltic concrete.

A second road is proposed for fire and evacuation egress only. This road exits the property on the east and connects to Mission Road. This road is proposed to be 20 foot improved.

Section 503.2.1, Dimensions, of the San Diego County Consolidated Fire Code includes the following exception: Upon approval of the fire code official, vertical clearances or road width may be reduced as long as the reduction does not impair access by fire apparatus. The steep topography and large vertical drops of the site results in large grading impacts that make it difficult to build a road 24 feet in width. The grading for the proposed secondary access creates large cut and fill slopes. The road is not to be used for primary access but "fire and emergency evacuation only." The road meets California Fire Code Section 503.2.1which requires an unobstructed width of 20 feet.

Fire Truck Turnarounds:

Driveways greater than 150 feet will require an approved fire department turnaround at the terminus. The proposed turnarounds shall be constructed to the satisfaction of the North County Fire Protection District.

Grade:

The maximum allowed grade for driveways is 20%. The proposed driveways do not propose grades greater than 20%. The proposed access road has grades ranging from 2 % to 12.5%.

Surface:

The proposed driveways and access road shall be paved with Asphaltic concrete. The angle of departure and angle of approach shall not exceed seven degrees (12%) or as approved by the Fire Chief.

Addresses:

Addresses shall be placed on all new buildings and at appropriate additional locations as to be plainly visible and legible from the proposed access road fronting the properties from either direction of approach. The numbers shall contrast with the background and the minimum size of the numbers shall be 4" in height with a minimum stroke of 3/8".

3. Building Construction:

   All structures shall comply with the enhanced ignition resistive construction requirements of the County Building Code.

4. Fire Protection Systems:

   All habitable structures and attached garages shall have residential fire sprinklers per County Consolidated Fire Code requirements.

5. Defensible Space:

   A minimum 100 foot Fuel Management Zone will be established and maintained around all structures over 250 square feet in size.

6. Vegetation Management:

   Prescribed Defensible Open Space will be maintained on at least an annual basis or more often as needed by the property owners. Planting used will be from an approved fire resistance planting materials list that is maintained by County of San Diego. The open space proposed on the RPO Encroachment Map/Open Space Map is for the protection of Steep Slopes. This easement does not preclude vegetation management. A copy of the map is attached.

7. Secondary Access

   Section 503.1.2, of the Consolidated Fire Code states that the maximum length of a dead-end road, including all dead-end roads accessed from that dead-end road, shall not exceed the 1320 feet for parcels from 1 to 4.99 acres, regardless of the number of parcels served. The cumulative dead-end length from the terminus of Emerald Hills Road to the intersection with North River Road is approximately 2540 feet (1870' offsite and 670' onsite).

   The project has analyzed the feasibility of obtaining a 40-foot wide secondary access easement through the northerly and westerly adjoining properties. The following is a summary of our research:

   Northerly

   There are 4 properties that abut the subject site to the north, Lots 7, 8, 10 and 11 of Map 13327. Lot 7 has an open space easement along the easterly half of the property and is a panhandle lot. According to Subdivision Ordinance Section 81.401.(f) "Panhandle lots may not serve access to any lot except the lot of which said panhandle is a part…" Lot 10 is also a panhandle lot, thus secondary access cannot be obtained through either of these lots without violating the subdivision ordinance. Lots 8 and 11 have areas that are just greater than 2 acres each. If a 40-foot wide private road easement were granted across either of these properties each lot would then have a net acreage of less than 2 acres, which is the minimum net area allowed in this zone. This would violate Subdivision Ordinance Section 81.401.(b) "Every lot shall contain the minimum lot area specified in The Zoning Ordinance…"

Based on the above information access to the north cannot be feasibly obtained without violating the Subdivision Ordinance.

Westerly

There are 3 properties that abut the subject site to the west, Parcels 1, 2 and 3 of Parcel Map 17379 (Parcel Map Attached). All 3 of these parcels are also just greater than 2 acres and if a 40-foot wide private road easement were granted across the properties the net area would be less than 2 acres, which would violate the Subdivision Ordinance. In addition, each of these properties are developed with homes and septic systems such that a private road would not be feasible without impacting one or both at each property.

The project has also reviewed the possibility of obtaining access across the properties southerly of the site from Emerald Hill Road and going westerly connecting to Via Puerta Del Sol. This route is not feasible due to topographic constraints and the fully developed properties that are just east of Via Puerta Del Sol.

The project is proposing to construct a fire and evacuation only access onsite that will connect from Emerald Hills Road onsite north through the project then east to Mission Road. This evacuation road will reduce the cumulative dead-end length from the terminus of the cul de sac onsite to the intersection with the evacuation road to approximately 640 feet. This dead-end length is in conformance with Section 503.1.2, of the Consolidated Fire Code.

8. Fire Behavior Computer Modeling:

Fire behavior modeling has been performed for the vegetation types located on the portion of the site east of State Route 76 where all of the development is to occur. The modeling data are included as an attachment and summarized here.

Several factors were taken into consideration when determining the fuel management zones including topography, degree of exposure, parcel size, and proximity to biological open space. In addition, the plan was developed with watershed protection and suitability of proposed plant species with regard to adjacency to biological open space as a consideration. Fire modeling was performed using Behave Plus 3.01 for three types of weather conditions, a Santa Ana weather condition, a peak weather condition and a summer weather condition. Weather data for the Santa Ana, peak and summer conditions were determined by the Standard Weather Parameters for the Coastal Zone from the County of San Diego Guidelines For Determining Significance and Report Format. An ambient temperature of 109^{o} F was used as a conservative model for all three weather conditions.

Table 1 Weather Inputs for the Coastal Zone			
Period	**Temperature (Fahrenheit)**	**Relative Humidity**	**Sustained Wind Speed (mph)**
Santa Ana	109°	0-4%	21
Peak	109°	0-4%	26
Summer	109°	10-14%	19

Modeling was performed for groves, dry grasslands, and coastal sage scrub, the vegetation communities on and adjacent to the proposed developed areas onsite. Table 2 identifies the habitats and fuel models used to represent these habitats.

Table 2 Habitats and Corresponding Fuel Models			
Habitat	**Fuel Model**	**Description**	**WUI Code Model (2007)**
Orchards/Groves	2 (Timber with grass and shrub understory)	Anderson (1982) classifies Fire Behavior Fuel Model 2 in the Grass Group and describes it as follows: Fire spread is primarily through the fine herbaceous fuels, either curing or dead. These are the surface fires where the herbaceous material, in addition to litter and dead-down stem wood from the open shrub or litter over-story, contribute to the fire intensity. Open shrub lands and pine stands or scrub oak stands that cover one-third to two-thirds of the area may generally fit this model; such stands may include clumps of fuels that generate higher intensities and that may produce firebrands. This is an appropriate model due to the fact that the primary carrier of fire within the groves will be the leave litter and grasses. The groves are "wetter" then what would normally occur in this model.	Medium Fuel
Dry Climate Grasslands	Gr4	The primary carrier of fire in this model is continuous, dry-climate grasses. The typical depth is two feet. This is a conservative model of for non-native grassland present onsite. This model allows that the grasslands may not always be mown.	Light Fuel
Coastal Sage Scrub	SCAL 18	This model has been developed specifically for this habitat.	Medium

The developed portion of the site is the top of a small north/south trending ridgeline. Steep slopes occur on the eastern portion of the property adjacent State Route 76. The slope was calculated to be 30%. The slope used for modeling both the Santa Ana and peak conditions is 30%. The slope in a southwesterly direction was calculated at 16%. The slope used for modeling the summer conditions is 16%. The modeling was performed using the weather conditions presented in Table 1. Table 3 summarizes the resulting flame lengths for each weather condition and vegetation type.

Table 3
Fuel Modeling Results

	Groves/Orchards Flame length	Grasslands Flame Length	Coastal Sage Scrub
Peak	14.9 feet	17.9 feet	28.1 feet
Santa Ana	12.6 feet	15.6 feet	25.8 feet
Summer	11.2 feet	14.4 feet	24.4 feet

The largest flame lengths and threat is associated with the coastal sage scrub on the lower portion of the steep easterly facing slope during a peak condition. The slope is approximately 30% and potentially in alignment with a Santa Ana wind condition. The resulting flame length is 28.1 feet. The remaining flame lengths are less than 28.1 feet. The model is an estimate of the flame lengths that can be anticipated. Actual fire behavior can be more or less intensive.

The coastal sage scrub is located a minimum of 200 feet from the proposed building pad on the remainder parcel. The area between the pad and the coastal sage scrub consists of groves. The minimum fuel management of 100 feet is almost 4 times the anticipated flame length for the coastal sage scrub during a peak condition and over 6 times the flame length for orchards during a peak condition.

Robin Church	3/10/10	Robin Church	Principal
Prepared By (Signature)	Date	Printed Name	Title

	3/6-2010	NOBU J. KATO.
Property Owner (Signature)	Date	Printed Name

FUEL MODELING

Modules: SURFACE, SCORCH

Description		Emerald Hills - Peak Conditions
Fuel/Vegetation, Surface/Understory		
Fuel Model		2, gr4, SCAL18
Fuel Moisture		
Dead Fuel Moisture	%	3
Live Fuel Moisture	%	50
Weather		
20-ft Wind Speed	mi/h	26
Wind Adjustment Factor		0.4
Wind Direction (from north)	deg	45
Air Temperature	oF	109
Terrain		
Slope Steepness	%	30
Aspect (from north)	deg	90

Run Option Notes

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind and spread directions are degrees clockwise from north [SURFACE].

Wind direction is the direction from which the wind is blowing [SURFACE].

Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]

Flame Length (ft) [SURFACE]

Direction of Maximum Spread (from north) (deg) [SURFACE]

Midflame Wind Speed (mi/h) [SURFACE]

Wind Adjustment Factor [SURFACE]

Wind/Slope/Spread Direction Diagram [SURFACE]

Fire Characteristics Chart [SURFACE]

Scorch Height (ft) [SCORCH]

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Emerald Hills - Peak Conditions

Fuel Model	ROS (max) ch/h	Flame Length ft	Direction Max ROS deg	Midflame Wind Speed mi/h	Wind Adj Factor	Scorch Height ft
2	196.4	14.9	227	10.4	0.4	260
gr4	303.4	17.9	227	10.4	0.4	361
SCAL18	107.4	28.1	227	10.4	0.4	761

Discrete Variable Codes Used
Emerald Hills - Peak Conditions

Fuel Model

2	Timber with grass and understory (S)
gr4	Moderate load, dry climate grass (D) (104)
SCAL18	Sage / Buckwheat

Modules: SURFACE, SCORCH

Description		Emerald Hills - Santa Anna
Fuel/Vegetation, Surface/Understory		
Fuel Model		2, gr4, SCAL18
Fuel Moisture		
Dead Fuel Moisture	%	3
Live Fuel Moisture	%	50
Weather		
20-ft Wind Speed	mi/h	21
Wind Adjustment Factor		0.4
Wind Direction (from north)	deg	45
Air Temperature	oF	109
Terrain		
Slope Steepness	%	30
Aspect (from north)	deg	90

Run Option Notes

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind and spread directions are degrees clockwise from north [SURFACE].

Wind direction is the direction from which the wind is blowing [SURFACE].

Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]

Flame Length (ft) [SURFACE]

Direction of Maximum Spread (from north) (deg) [SURFACE]

Midflame Wind Speed (mi/h) [SURFACE]

Wind Adjustment Factor [SURFACE]

Wind/Slope/Spread Direction Diagram [SURFACE]

Fire Characteristics Chart [SURFACE]

Scorch Height (ft) [SCORCH]

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Emerald Hills - Santa Anna

Fuel Model	ROS (max) ch/h	Flame Length ft	Direction Max ROS deg	Midflame Wind Speed mi/h	Wind Adj Factor	Scorch Height ft
2	135.7	12.6	227	8.4	0.4	212
gr4	226.0	15.6	228	8.4	0.4	309
SCAL18	89.4	25.8	228	8.4	0.4	689

Discrete Variable Codes Used
Emerald Hills - Santa Anna

Fuel Model

2	Timber with grass and understory (S)
gr4	Moderate load, dry climate grass (D) (104)
SCAL18	Sage / Buckwheat

Modules: SURFACE, SCORCH

Description		Emerald Hills - Summer
Fuel/Vegetation, Surface/Understory		
Fuel Model		2, gr4, SCAL18
Fuel Moisture		
Dead Fuel Moisture	%	3
Live Fuel Moisture	%	50
Weather		
20-ft Wind Speed	mi/h	19
Wind Adjustment Factor		0.4
Wind Direction (from north)	deg	225
Air Temperature	oF	109
Terrain		
Slope Steepness	%	16
Aspect (from north)	deg	180

Run Option Notes

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind and spread directions are degrees clockwise from north [SURFACE].

Wind direction is the direction from which the wind is blowing [SURFACE].

Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]

Flame Length (ft) [SURFACE]

Direction of Maximum Spread (from north) (deg) [SURFACE]

Midflame Wind Speed (mi/h) [SURFACE]

Wind Adjustment Factor [SURFACE]

Wind/Slope/Spread Direction Diagram [SURFACE]

Fire Characteristics Chart [SURFACE]

Scorch Height (ft) [SCORCH]

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Emerald Hills - Summer

Fuel Model	ROS (max) ch/h	Flame Length ft	Direction Max ROS deg	Midflame Wind Speed mi/h	Wind Adj Factor	Scorch Height ft
2	110.6	11.4	44	7.6	0.4	188
gr4	190.1	14.4	44	7.6	0.4	279
SCAL18	79.0	24.4	44	7.6	0.4	639

Discrete Variable Codes Used
Emerald Hills - Summer

Fuel Model

2	Timber with grass and understory (S)
gr4	Moderate load, dry climate grass (D) (104)
SCAL18	Sage / Buckwheat

NORTH COUNTY FIRE PROTECTION DISTRICT

330 S. Main Avenue • Fallbrook, California 92028 • (760) 723-2005 • Fax (760) 723-2004 • www.ncfire.org

July 16, 2010

County of San Diego
Department of Planning and Land Use
5201 Ruffin Road, Ste. B.
San Diego, CA. 92123-1666

RE: TPM 21057

Please review the following comments regarding this project:

The revised fire protection plan dated March 11, 2010 is approved. The applicant has adequately addressed the over dead end length road and this agency finds the modifications do not lessen, health, life and safety requirements.

Please feel free to contact me if you have any questions,

Sid Morel
Fire Marshal